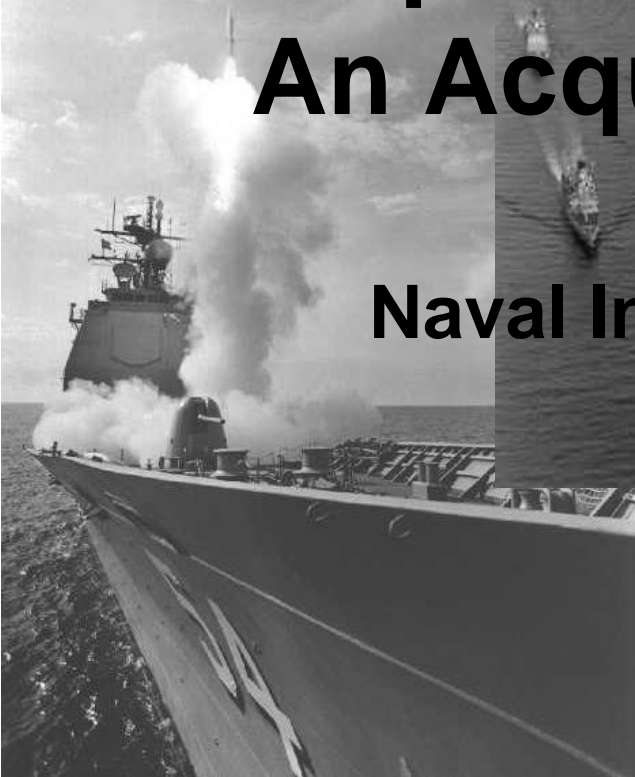
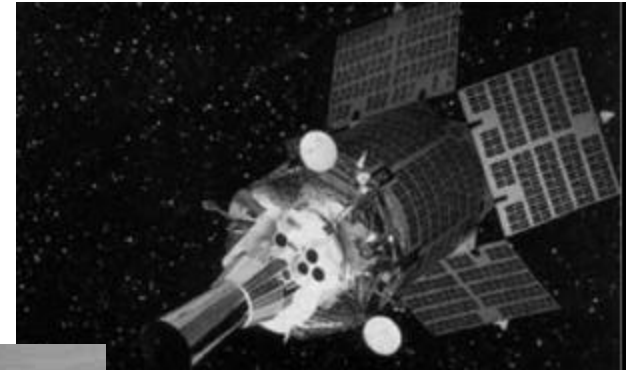


**ASN (RDA)
CHIEF ENGINEER**

Interoperability: The Navy View - An Acquisition Perspective

**Naval Interoperability Workshop
30 May 2001**



Unclassified

**RADM Kate Paige
RDA CHENG**

Report Documentation Page

Report Date 30052001	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle Interoperability: The Navy View - An Acquisition Perspective	Contract Number	
	Grant Number	
	Program Element Number	
Author(s) Paige, Kate	Project Number	
	Task Number	
	Work Unit Number	
Performing Organization Name(s) and Address(es) RDA CHENG	Performing Organization Report Number	
Sponsoring/Monitoring Agency Name(s) and Address(es) NDIA (National Defense Industrial Association 2111 Wilson Blvd., Ste. 400 Arlington, VA 22201-3061	Sponsor/Monitor's Acronym(s)	
	Sponsor/Monitor's Report Number(s)	
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes Proceedings from Armaments for the Navy Interoperability Workshop, 30-31 May 2001 sponsored by NDIA.		
Abstract		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	
Classification of Abstract unclassified	Limitation of Abstract UU	
Number of Pages 25		

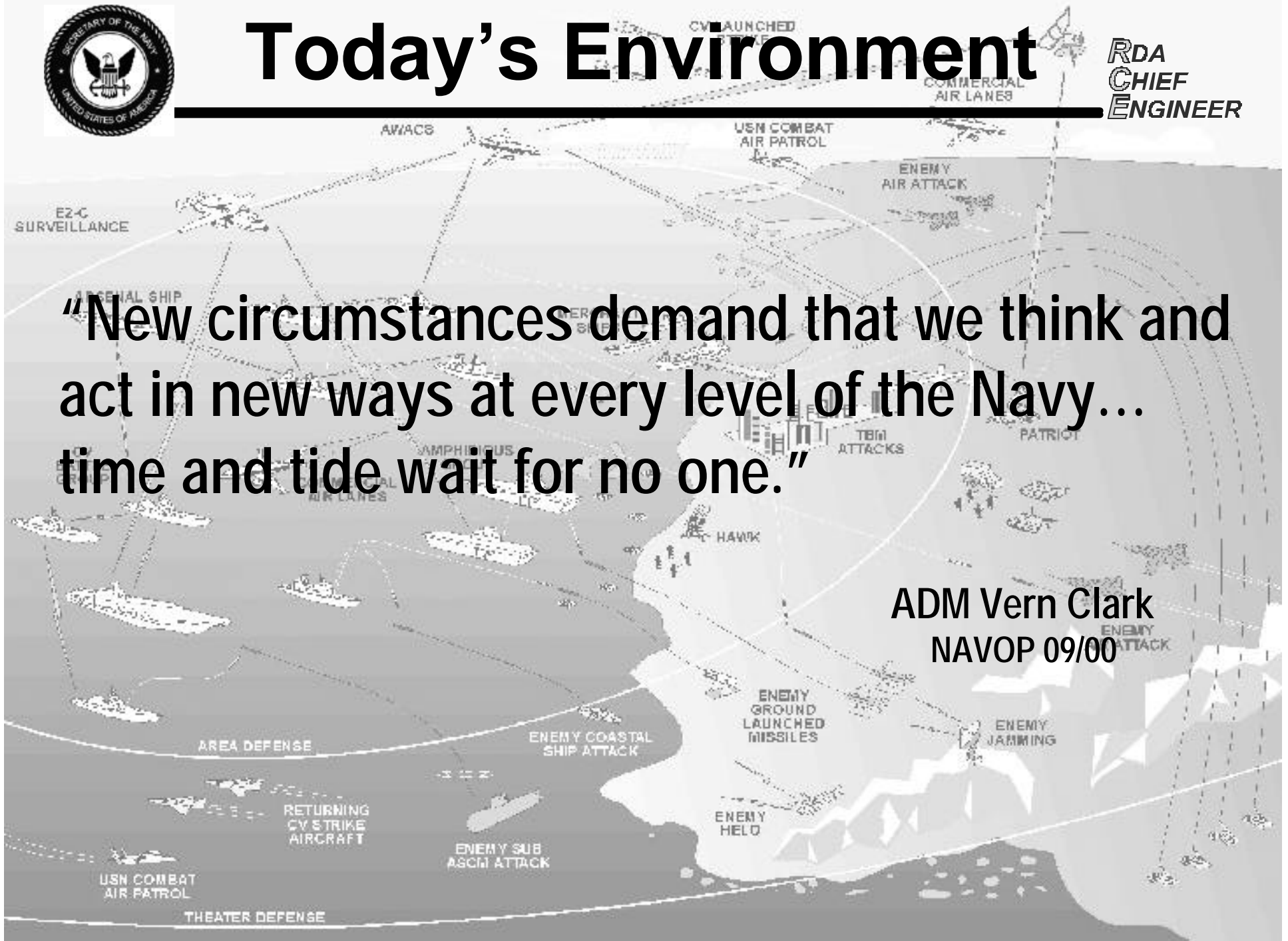


**RDA
CHIEF
ENGINEER**



"New circumstances demand that we think and act in new ways at every level of the Navy... time and tide wait for no one."

ADM Vern Clark
NAVOP 09/00





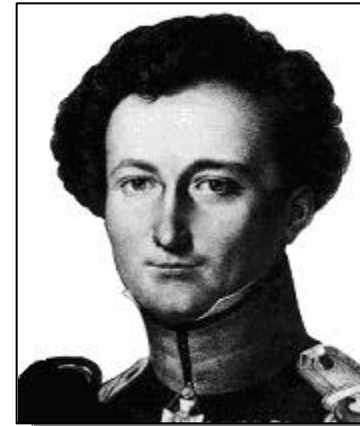
Nothing New Under the Sun

RD&A
CHIEF
ENGINEER

"... in war, more than in any other subject we must begin by looking at the nature of the whole; for here more than elsewhere the part and the whole must always be thought of together."



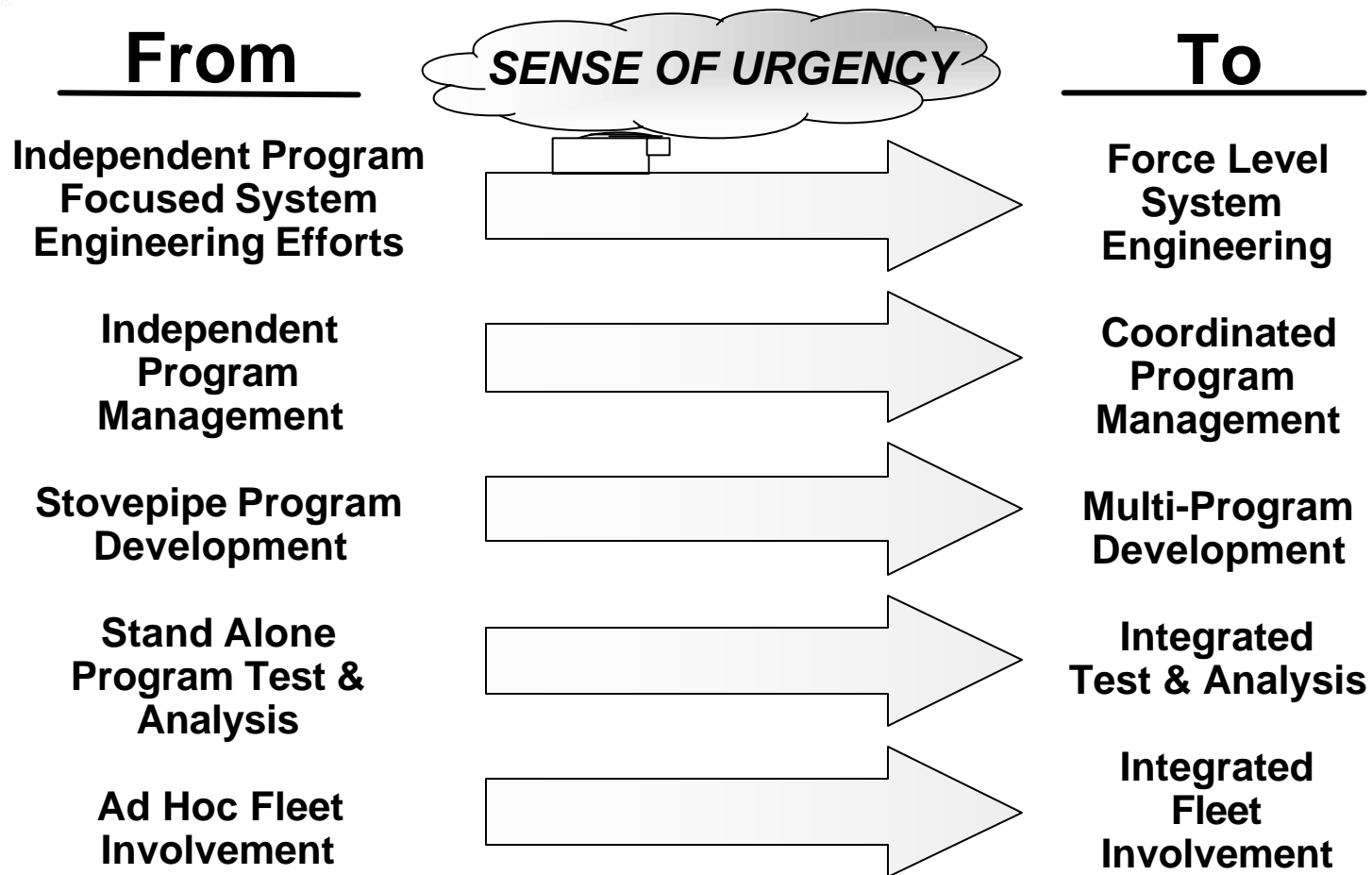
-- Carl von Clausewitz
On War
(1832)





The World is Changing

**RD&A
CHIEF
ENGINEER**



***Without Abandoning the Rigor of
Engineering the Fighting Unit***

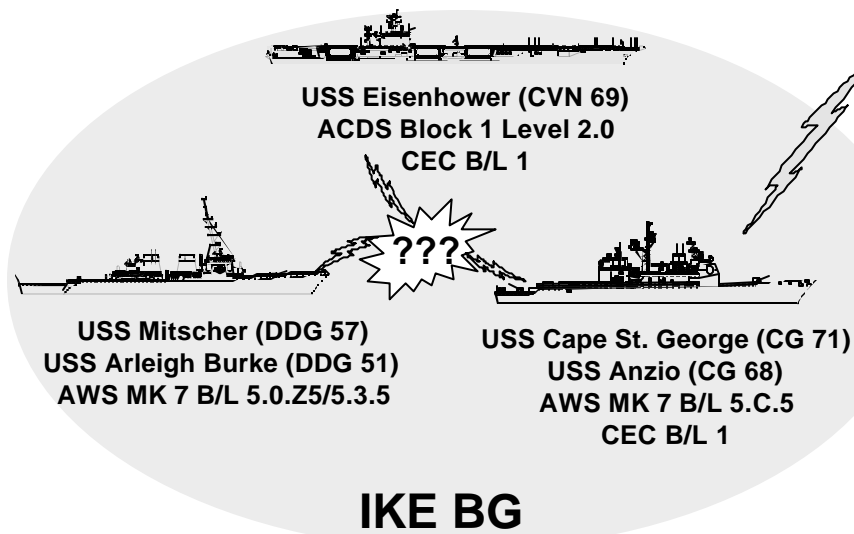
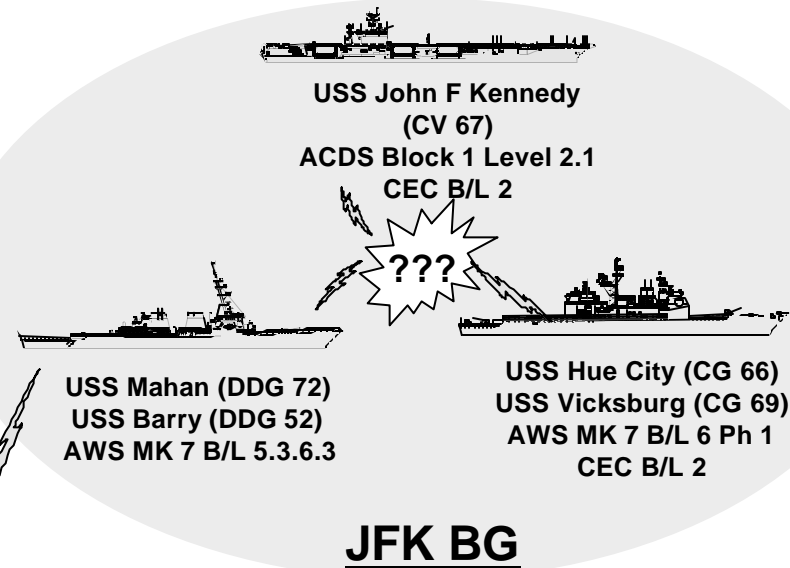


Navy Battlegroup Operations: 1997-1998

RD&A
CHIEF
ENGINEER

CNO WASHINGTON DC 021648Z MAY 98

"The introduction of increasingly complex warfighting capabilities into the fleet has resulted in significant battle group interoperability challenges."



CINCLANTFLT BGSIT 021731ZMAR98

BGSIT Hot Wash-Up Message

" This report highlights the complexity of BG system architecture, lack of systems successful integration and failure of critical equipment. **In combination, the factors created an incoherent tactical picture for BG operators.**"

DATE: 27 FEB 2001 TIME: 22:51:40 GMT
RANGE SCALE: 100 NM
[TACTICAL NETWORK ID]

Lat: 37:12:48 N
Lon: 078:34:08 W

27 FEB 01 CEC TECHEVAL

- **11 CEC Node Network**
- **800-1100 Tracks**
- **700x800 nm Coverage**
- **4 Hour Stress Test Period**

□ Brg Rng
own->cur 256 T 155
own->pri
own->sec
pri->sec



CEC TECHEVAL: Link Interoperability

**RD&A
CHIEF
ENGINEER**

- **CEC Battle Group Operated in a Demanding Link Environment:**

- **Participants**

- **Eight Surface Units**

- **Four Different Combat Systems**

- Both Model 5 and Model 4
- USG 1 & 2

- **Group II E-2C**

- **Both CEC Equipped NP-3C and A125 E-2C**

- **USG 3**

- **Two Land Based Test Sites**

- **High Track Loads**

- **Over 1000 tracks provided via airborne CEC units**



The Navy's Organizational Response

**RD&A
CHIEF
ENGINEER**

- **PEO (Theater Air Defense) & PEO (AEGIS / Surface Combatants) Merged into Single PEO for Theater Surface Combatants - April 98**
- **CNO Designated NAVSEA (SEA 05) as CNO Lead for Battle Force Interoperability - May 98**
- **OPNAV Initiates Integrated Warfare Architectures (IWAR) Process**
- **ASN(RDA) Designates Chief Engineer as Senior Technical Authority Within the DoN Acquisition Structure**
- **OPNAV Reorganization: N8 → N7, N8, ACNO (MD)**
- **Joint SIAP SE Organization Established With Navy as Lead**

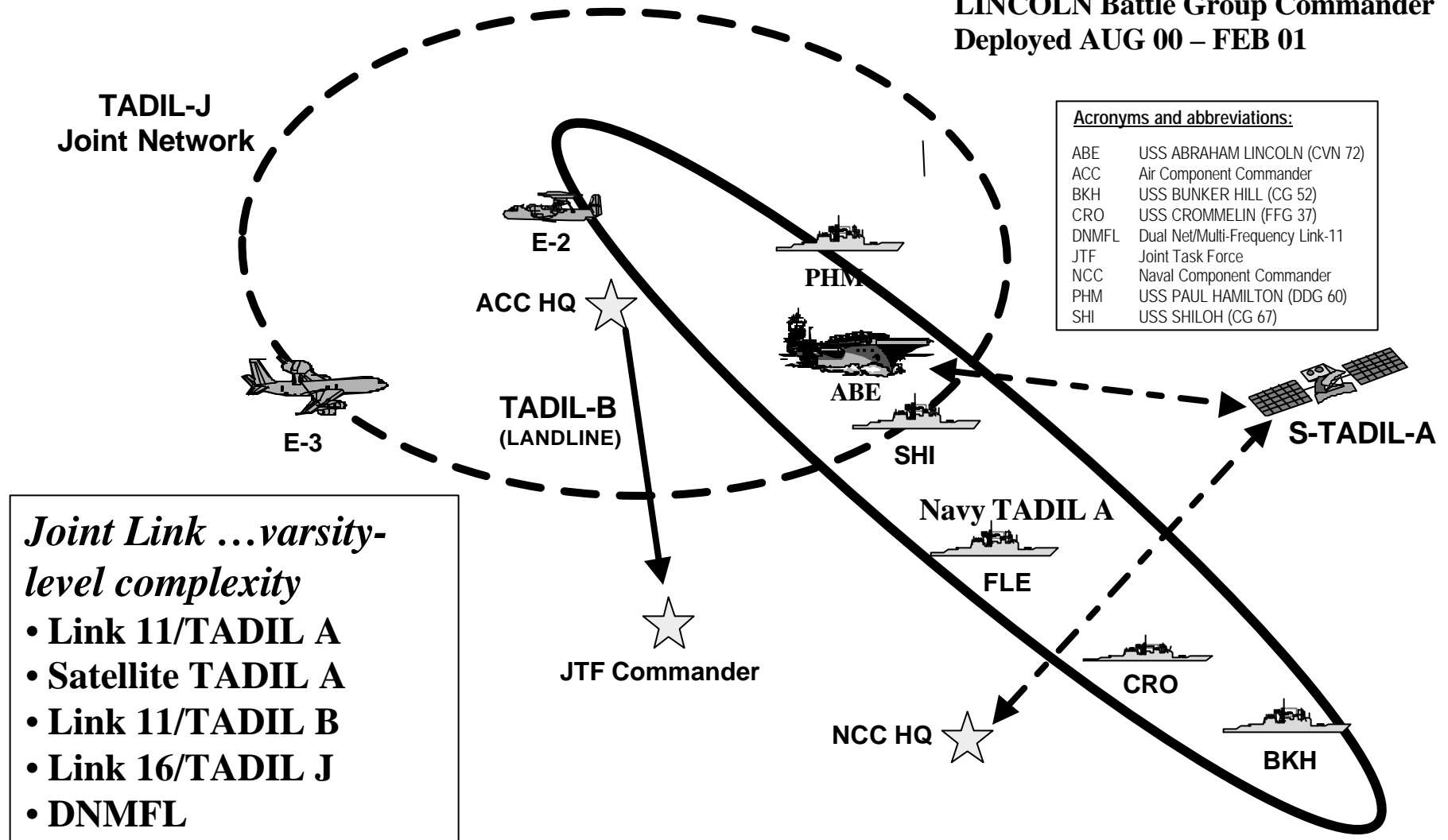


Battle Group Link Operations

**RD&A
CHIEF
ENGINEER**

“We Are Making Progress With Interoperability”

RADM Phil Balisle
LINCOLN Battle Group Commander
Deployed AUG 00 – FEB 01

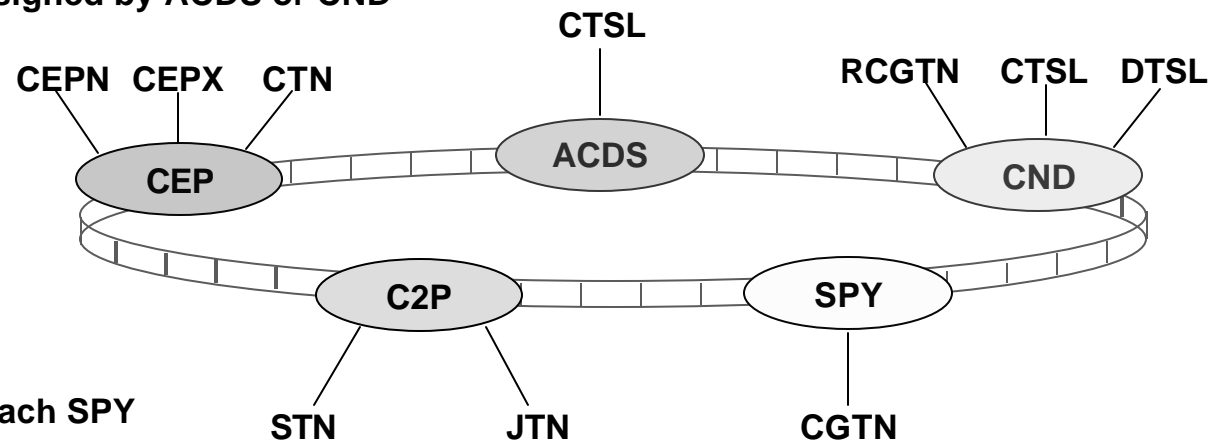




Track Number Management, Please

**RD&A
CHIEF
ENGINEER**

- **STN/JTN**
 - TADIL index used by all link units, assigned by R2 unit (C2P)
- **CTSL**
 - local combat system index, assigned by ACDS or CND
- **CEPN**
 - CEC index used by all CUs, assigned by originating CEP
- **CEPX**
 - local CEP index, assigned by each CEP
- **CGTN**
 - local SPY index, assigned by each SPY
- **CTN**
 - CEP local radar track index, assigned by each CEP adaptive function (SPY, 48, 49, IFF)
- **DTSL**
 - local CND Adjunct index
- **RCGTN**
 - local SPY reserved CGTN, index used for remote SPY measurements and special acquisition, assigned by each CND

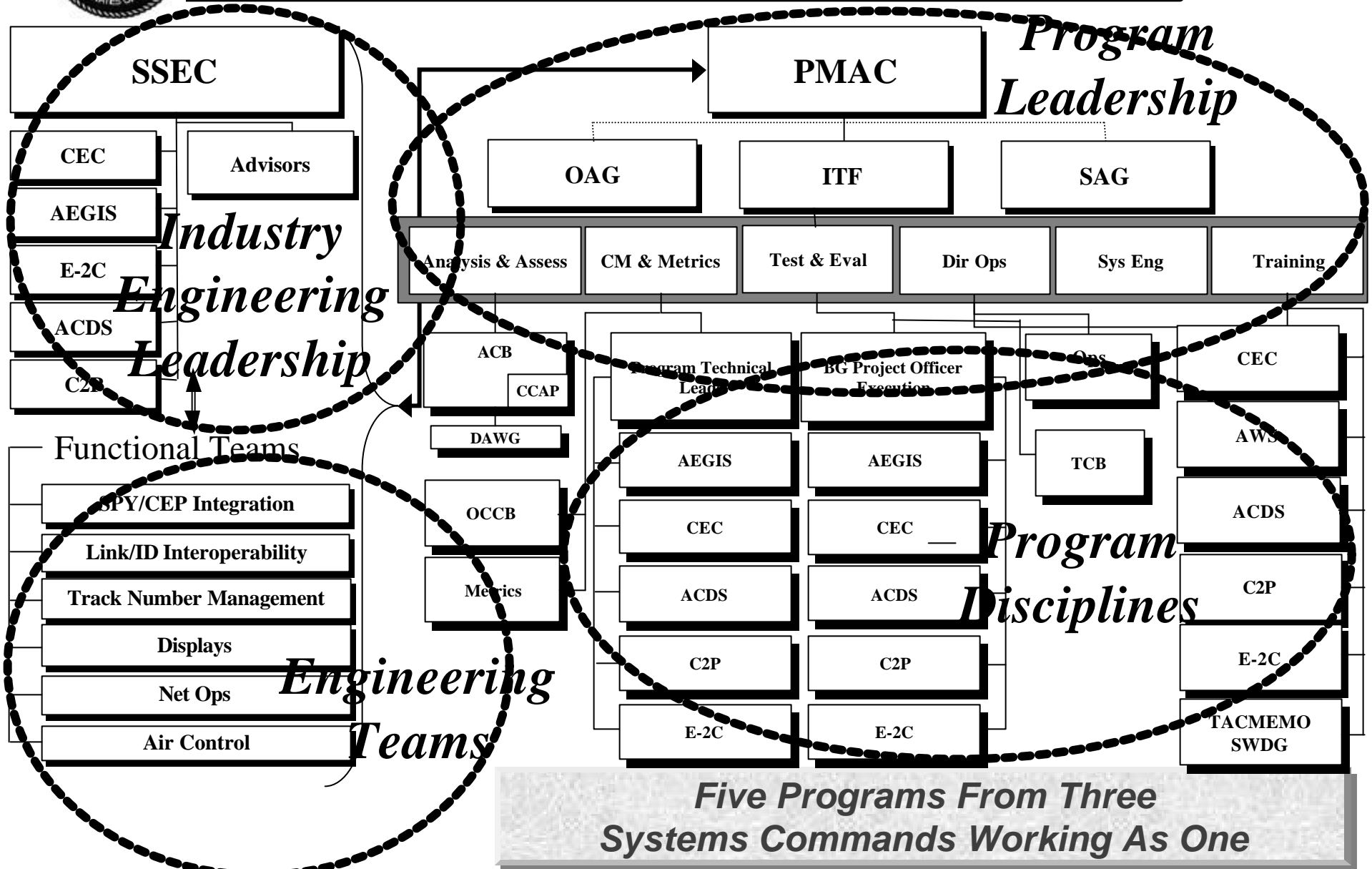




A System of Systems Success Story

The Road to CEC OPEVAL

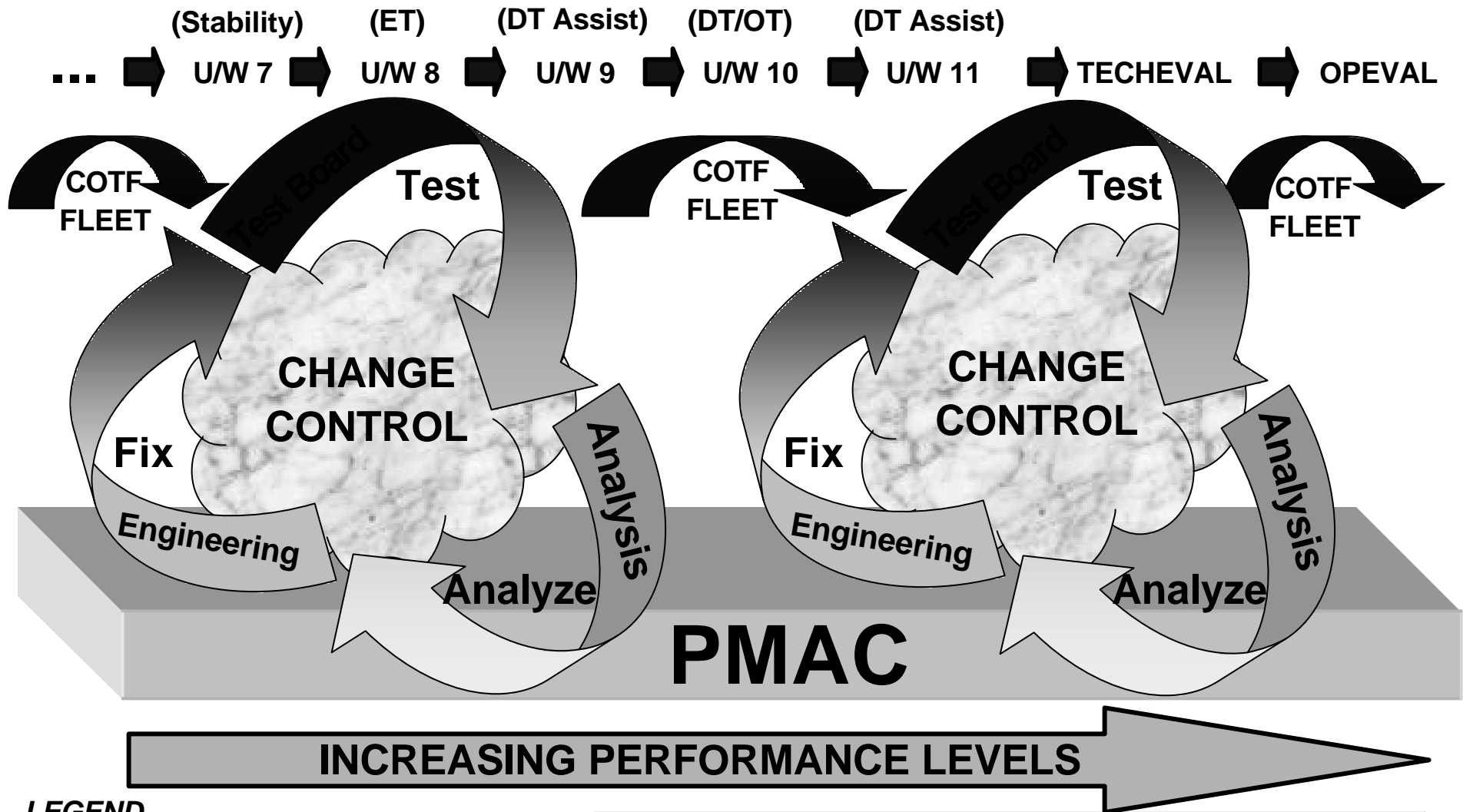
RD&A
CHIEF
ENGINEER





Interoperability Task Force: Test - Analyze/Assess - Fix

RD&A
CHIEF
ENGINEER



LEGEND

PMAC - Program Managers Advisory Council
COTF - Commander Operational Test & Evaluation Force

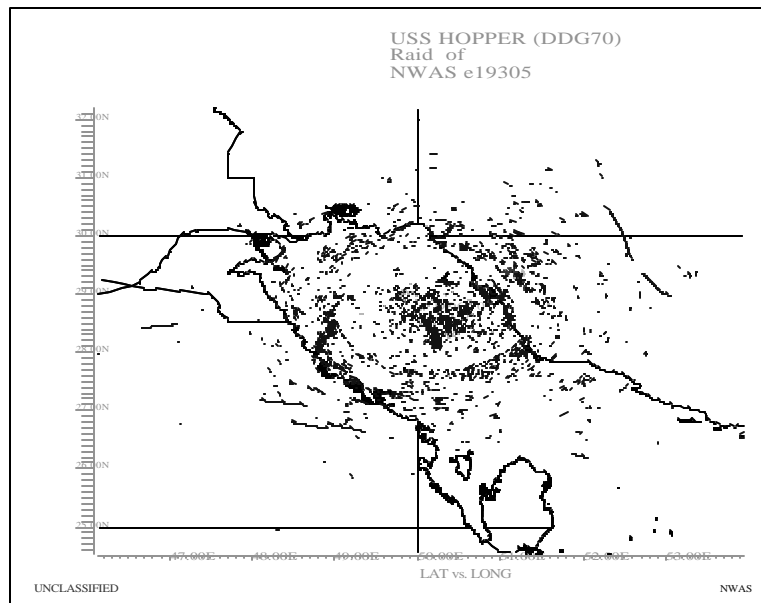
Test - Analyze/Assess - Fix



AEGIS DEA Improvement Program

**RD&A
CHIEF
ENGINEER**

- **Goal:**
 - **Improve Radar Performance in the Littoral**
 - Reduce False DEA Identification
 - Reduce Track Maintenance Resource Requirements
 - Improve Track Continuity for Clear and DEA Targets



By Redesigning:

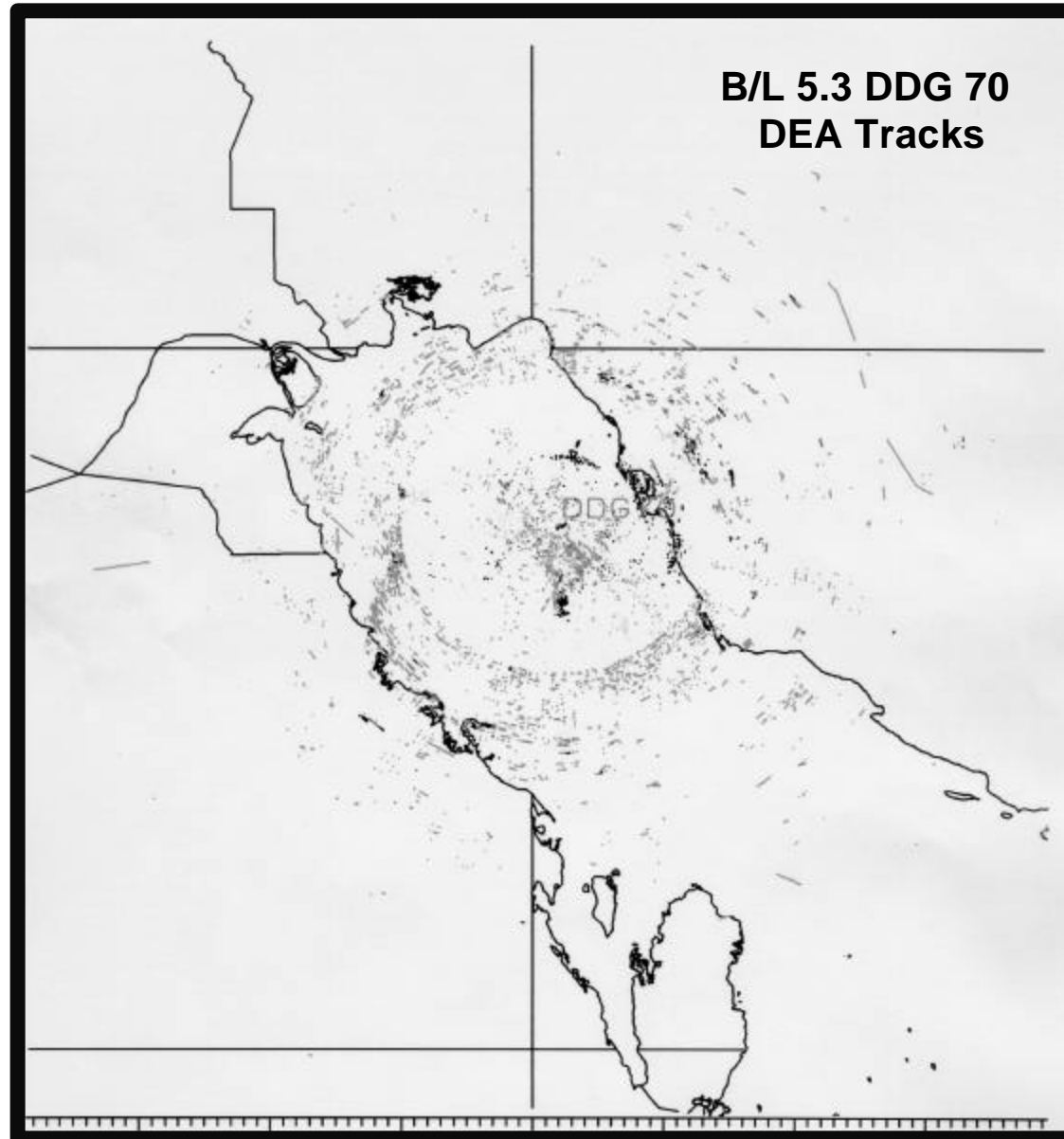
- DEA Identification and Maintenance
- Track Steal Avoidance Logic
- Acceleration Sensing
- Track Filtering
- Track Association and Gating

***Interoperability is
More Than a
Data Link Issue***



AEGIS DEA Improvement Program Command and Control Results - June/July 2000

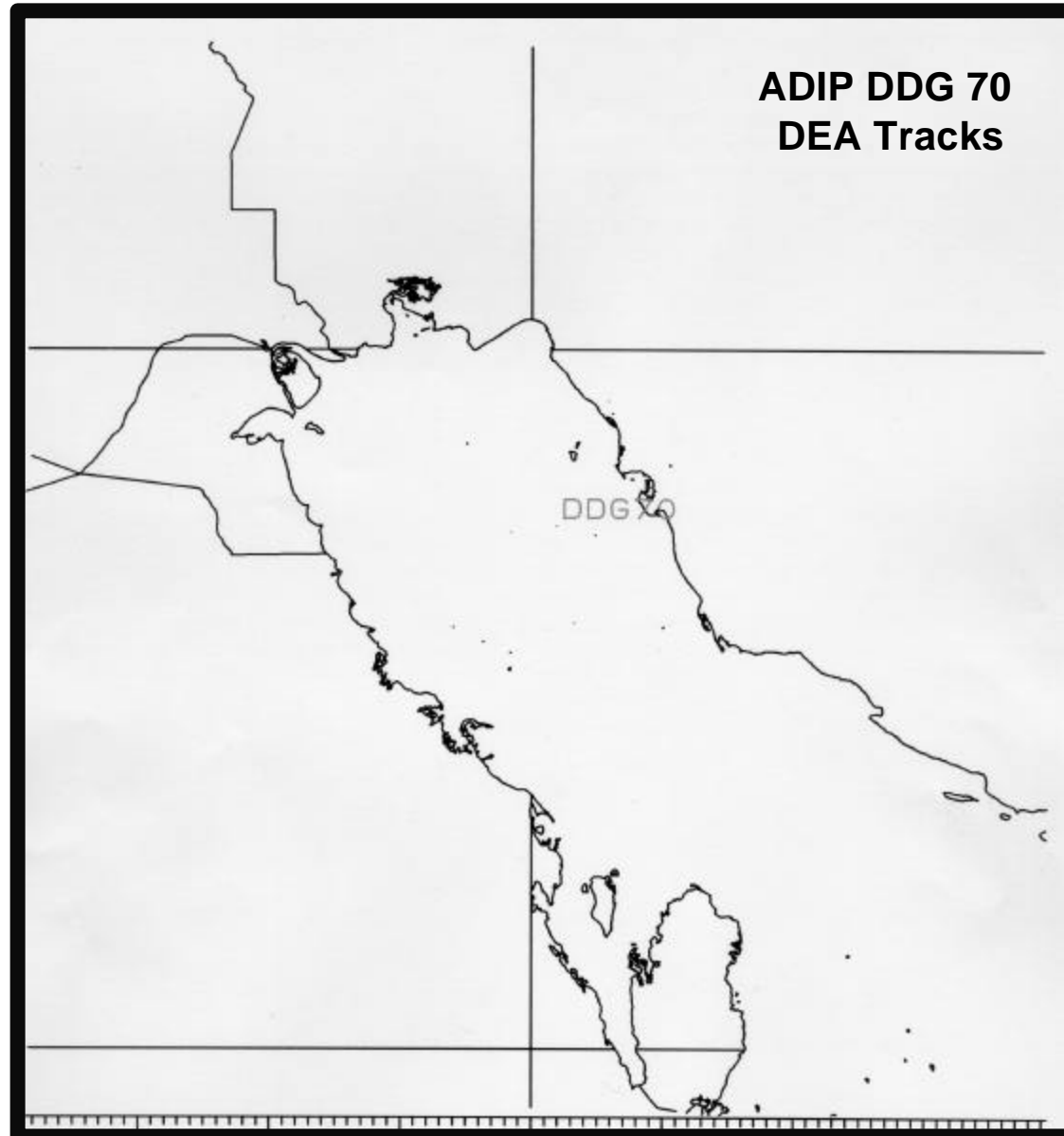
RD&A
CHIEF
ENGINEER





AEGIS DEA Improvement Program Command and Control Results - June/July 2000

RD&A
CHIEF
ENGINEER





CC&D Warfighting Benefits

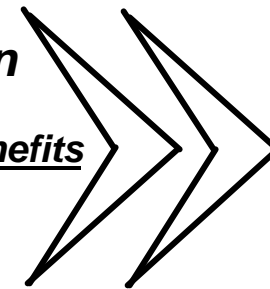
**RD&A
CHIEF
ENGINEER**

Improved Interoperability...

- Completeness
- Clarity
- Accuracy
- Continuity
- Commonality

Both of
• *Information*
And
• *Action*

Warfighting Benefits



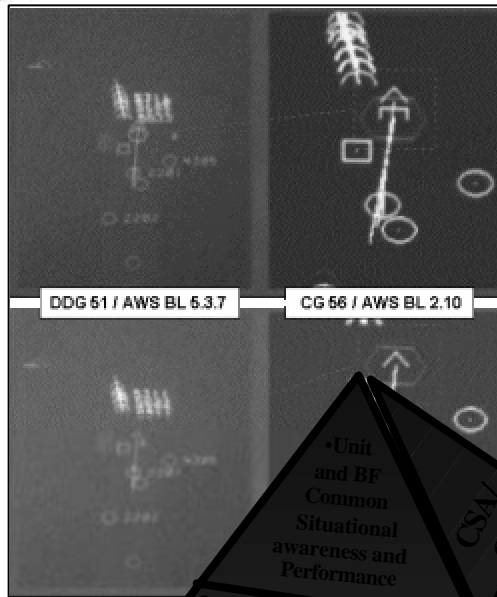
Increased
Ability To
Utilize Available
Sensor
And Weapon
Assets

- **Shared coherent and correct situation awareness**
- **Reduction in decision reaction time**
- **Increased decision effectiveness**
- **Collaboration among units ... sharing of assets**

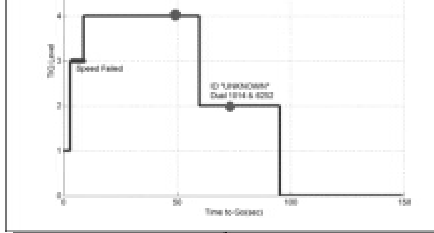


Analytical Tools – Essential to Progress

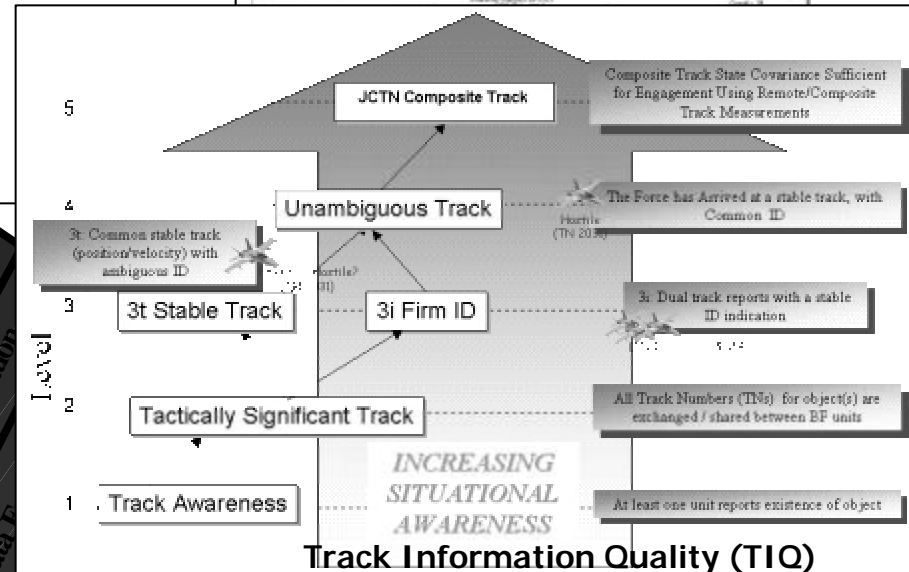
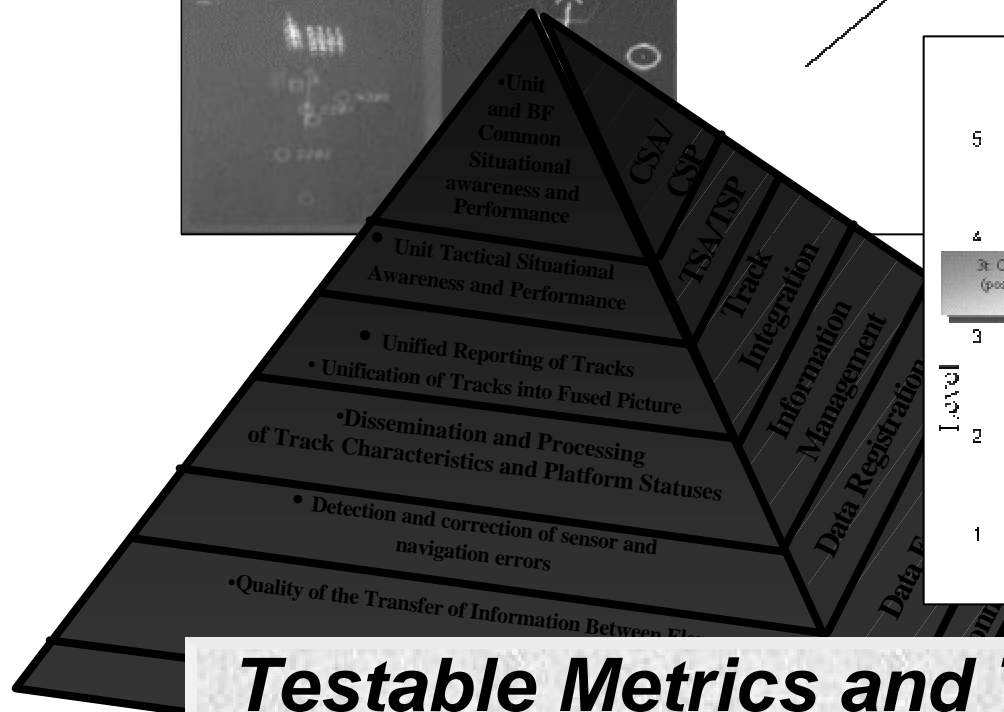
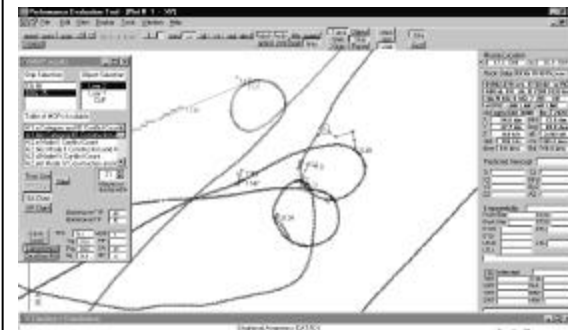
**RD&A
CHIEF
ENGINEER**



Quantification of BG/BF Information



Performance Evaluation Tool (PET)



Testable Metrics and Tool Requirements Extracted from Requirements Trace



NAVSEA 53

Roles and Responsibilities

**RD&A
CHIEF
ENGINEER**

CNO DIRECTION:

- **COMNAVSEASYS COM is assigned central responsibility to address BMC4I/Combat Systems interoperability problems within the SYSCOMS/PEOs, and to coordinate resolution with the fleet. (CNO RMG 021648Z May 98)**
 - **Develop policy and architecture for BF Warfare Systems Engineering Process**
 - **Implement a common Warfare Systems Engineering Process**
 - **Provide top level direction for fielding and support of balanced combat systems in shipboard submissions**
 - **Develop and implement, with OPNAV and FLTCINCs, an improved battle group interoperability management process**

COMNAVSEA RESPONSE:

- **Assigned single office with responsibility for implementation/execution of Battle Force Interoperability (SEA 53)**
- **Designated Battle Force Systems Engineer (SEA 007)**
- **Issued guidance and policy paper 98-03, with FLTCINC concurrence, as interim guidance**



SEA 53 Products & Processes Supporting Interoperability Today

**RD&A
CHIEF
ENGINEER**

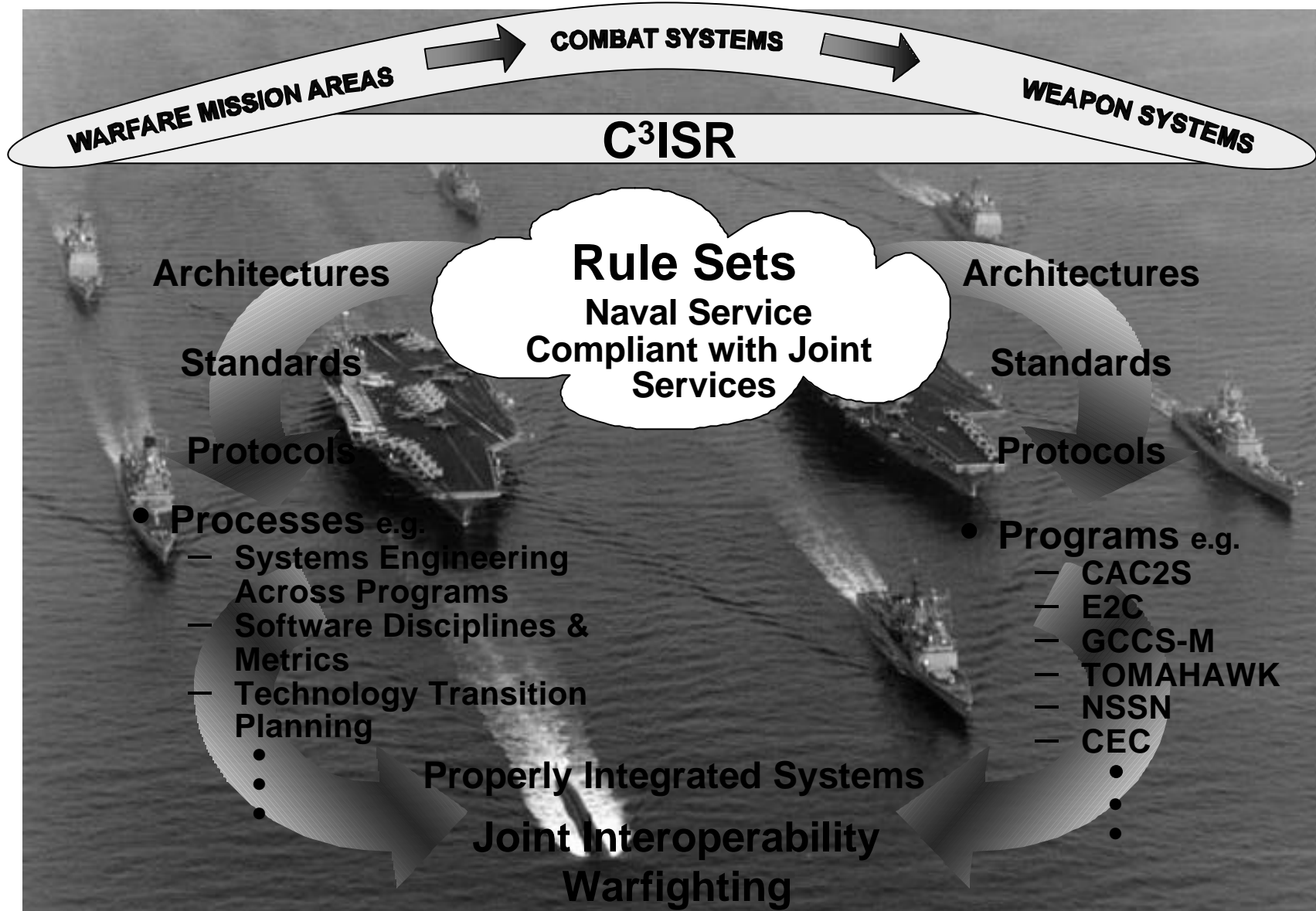
- **Tools, Process and People in Place**
 - Navy Distributed Engineering Plant (DEP)
 - D-30 Certification Process
 - Battle Force Action Officer/Fleet Liaison Program
- **Responsive to CNO/Fleet Requirements**
 - Joint CLF/CPF Instruction 4720.3A (D-30 policy)
 - CPF RMG 251912Z May 00 (adapts FDNF to D-30)
- **Shifted Interoperability Focus From Ship-Centric to Battle Group-Centric**
- **Moved Interoperability Testing Ashore**
- **Credibility established - CINPACFLT RMG 300229Z Aug 00**

***A Disciplined Systems Engineering
Approach Is In Place, and Is Maturing***



RDA CHENG Philosophy

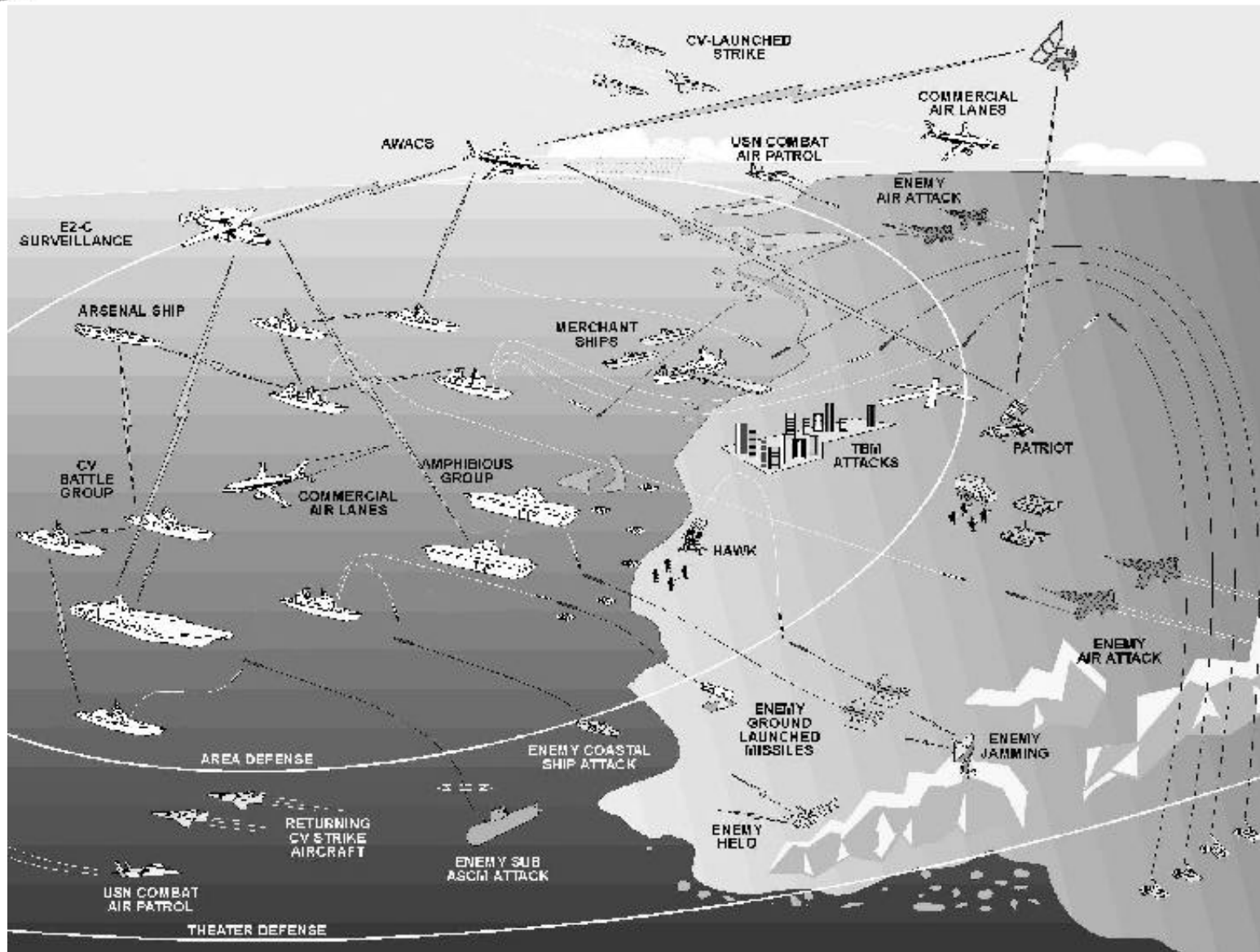
**RD&A
CHIEF
ENGINEER**





SIAP: An Operational Imperative

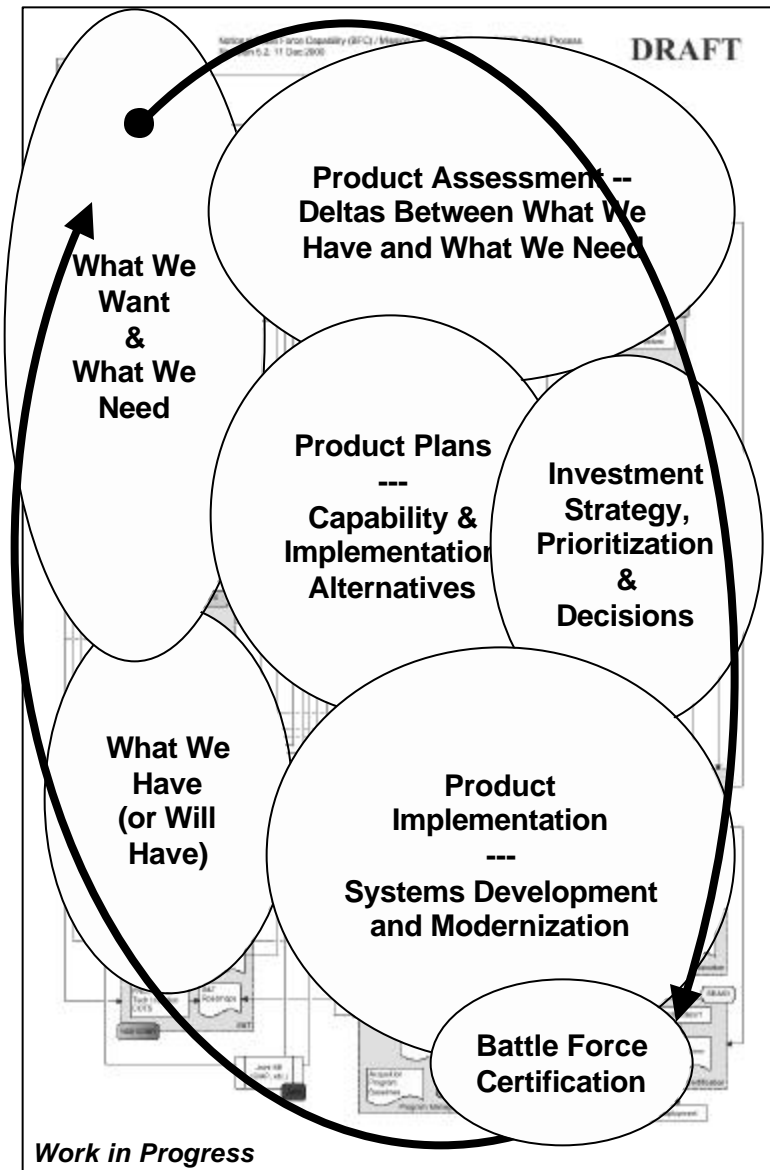
RD&A
CHIEF
ENGINEER





BFC/MCP Global Process

**RD&A
CHIEF
ENGINEER**



Changes to the status quo:

- Requirements integration
- Integrated capability architectures
 - Linked to service/joint strategy
 - Approved at highest levels
 - Linked to Navy's PPBS process
- Integrates the DoD decision support systems
 - Requirements generation
 - PPBS
 - Acquisition management

***A Unified Work in Progress Among
OPNAV, SEA 53,
RDA CHENG, SIAP SE***



Conversation and Interoperability: An Analogy

RDA CHIEF ENGINEER

"A conversation is a dialogue, not a monologue. That's why there are so few good conversations: due to scarcity, two intelligent talkers seldom meet."

Truman Capote



Conclusion

**RD&A
CHIEF
ENGINEER**

- **Lessons Learned Implementation**
 - Organizational change (structural/behavioral)
 - Developmental speed and agility achieved through adherence to fundamentals
 - Clearly identified and defined system boundaries
 - Disciplined system engineering
 - Clearly documented and articulated interoperability requirements
 - Visible and meaningful involvement of the operator... for interoperability... More is better
- **Interoperability is a Priority Issue**

From “Fire Fighting” to “Fire Prevention!”